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EXAMINER	
AFZALI, SARANG	
ART UNIT	PAPER NUMBER
3726	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,458	ASBECK ET AL.	
	Examiner	Art Unit	
	SARANG AFZALI	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *1-11 and 25-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 February 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group II and species of Figure 3 in the reply filed on 2/25/2008 is acknowledged. The traversal is on the ground(s) that the Examiner's assertion that the method claims 12-25 could be utilized to make a materially different product such as a pipe coupling is inaccurate and that casting and molding would not result in the multiple part assembly with force-locking connections between the cams and shaft as taught by the present invention. The Applicant further argues that elected group of claims 12-24 read on each and every species illustrated in Figures 2, 3, 4, 5 and 6 and as such, asserts that the cited embodiments would provide no undue burden on the Examiner, would not raise any additional issues and concludes that no proper indication of different classification or field of search nor a proper prima facie case for restricting the claims has been established.

This is not found persuasive because a materially different process such as casting or molding process would indeed result in the end product of claim 1 irrespective of how the connections between the parts are made as recited in dependent claims 2-11. As such the product of claims 1-11, process of claims 12-25 and apparatus of claims 26-36 have indeed acquired a separate status in the art in view of different classification and as such require a different field of search that would be a serious burden on the examiner if restriction is not required. Furthermore, the step of simultaneous or non-simultaneous forming of the indentations on the shaft would raise an additional issue in the process of making the camshaft.

Therefore, elected claims 12-24 are still pending in the application and non-elected claims 1-11 and 25-36 are withdrawn from further consideration.

The requirement is still deemed proper and is therefore made FINAL.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: A METHOD OF PRODUCING A CAMSHAFT ASSEMBLY.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "bend is dimensioned such that after cooling, the longitudinal axis of the tubular shaft is aligned" is awkward and unclear as to how and what part of the bend is dimensioned? In addition, it is not clear as to how exactly the alignment of the longitudinal axis of the tubular shaft is being done? Is the axis being aligned with respect to the shaft itself or the shaft is being aligned in the longitudinal direction with respect to a reference line or plane?

5. Claim 18 recites the limitation "the radial direction" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 18 and 22 recite the limitation of "the longitudinal axis of the shaft" in lines 3 & 4. There is insufficient antecedent basis for this limitation in the claims.

Claim 20 recites the limitation of "the longitudinal axis of the tubular shaft" in lines 2 & 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 12, 13 and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Spiegel et al. (US 2005/0217109).

As applied to claim 12, Spiegel et al. teach a method of making a camshaft assembly comprising:

providing a tubular shaft (1, Figs. 1a-b & 2)

sliding a plurality of cams (3, Figs. 1a-b), each having a through-aperture, onto the tubular shaft (1);

securing the cams onto the tubular shaft at defined distances from each other (Figs. 1a-b);

locally heating the tubular shaft between at least two cams (paragraph [0019], line 31); and

hot-forming a lateral indentation (2, Fig. 1a-b & 2) in the shaft in the locally heated region.

Spiegel et al. teach that the pressing (forming of indentations 2) may occur while the tube is hot which teaches the claimed limitation of “locally heating the tubular shaft.”

Note that the limitations of “locally heating” and "locally heated region” do not preclude the camshaft tube from being heated throughout its length or having heated regions throughout its length.

As applied to claim 13, Spiegel et al. teach a method of making a camshaft assembly comprising forming projections surrounding the indentation to increase the outer diameter of the tubular shaft beyond the cross-section of the through-apertures of the cams (paragraph [0009], lines 1-15).

As applied to claim 16, Spiegel et al. teach a method wherein the step of hot-forming occurs with the tubular shaft clamped in a die (bottom die 11 and top pressing stamp 10, Figs. 3-5) such that in regions adjacent the indentation, the original outer diameter of the tubular shaft is substantially maintained (Fig. 2, paragraph [0019], lines 31-34 & paragraph [0020], lines 22-24).

As applied to claim 17, Spiegel et al. teach a method wherein the cams are slid onto the shaft after the step of hot-forming the indentations (paragraph [0019], lines 31-39).

A method according to claim 18, Spiegel et al. teaches a method wherein the indentations (2) are formed sequentially (paragraph [0020], lines 37) by introducing local mechanical force (by means of pressing stamp 10) at the locally heated region in the radial direction relative to the longitudinal axis of the shaft (Fig. 2, paragraph [0019], lines 24-31).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al. in view of Makoto et al. (JP 61135434 A).

As applied to claim 14 and 15, Spiegel et al. teach the invention cited including a conventional method of mounting cams onto the shaft but do not explicitly teach the radially cold-forming and hydraulic internal pressure to the tubular shaft to form press-fits with the cams.

However, it is well known in the art to use a pressurized fluid to provide an outward radial expansion of a tubular shaft into a press fit connection with the interior of an outer sleeve such as one taught by Makoto et al. wherein the inside of a hollow cam shaft (11, Fig. 4) is pressurized by pressure fluid to radially expand the material (12) of the shaft into a press-fit connection with the cams (13's & 14's, Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided Spiegel et al. with a conventional cold forming mounting step utilizing hydraulic internal pressure technique in view of the teachings of Makoto et al. in order to effectively secure the cam components onto a cam shaft.

10. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al. in view of Good (US 3,210,223).

As applied to claims 19 and 20, Spiegel et al. teach the invention cited including the step of introducing local mechanical force at local region in the radial direction relative to the longitudinal axis of the shaft but fails to explicitly teach the claimed bending moment/alignment of the tubular shaft.

However, it is well known in the art to subject a workpiece to a pre-stress loading and deformation at desired locations in order to counteract any subsequent deformation that may arise in the workpiece once subjected to any additional processes or during use such as one taught by Good wherein a bending moment is provided in a shaft (33, Fig. 7) to oppose bending or warping force set up in the axle (shaft) during the heat treatment (col. 8, lines 15-20) resulting in the axle (shaft) staying in straight position.

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided the shaft of Spiegel et al. with a bending moment in light of the teachings of Good in order to provide an effective means of counteracting any undesired bends or deformity appearing in the shaft once subjected to the indentation forming step.

Note that both Spiegel et al. and Good are pertinent to one of the problems with which the instant invention is concerned with, which is mainly to provide an improved shaft assembly subjected to different manufacturing processes that may compromise the straightness and rigidity of the shafts.

Regarding the limitation of "after cooling" in claim 20, note that since Good teaches the heating step, also teaches the cooling step that would naturally occur after each heating step.

11. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al. in view of Haerr (US 3,025,905).

As applied to claims 21-23, Spiegel et al. teach the invention cited including heating region of the shaft and upper and lower forming dies to provide mechanical force on the shaft but do not explicitly teach the electric resistance heating step, opposed electrodes and introducing a force with at least one of the electrodes.

However, it is well known in the art to use two opposed electrodes substantially located transversely to the longitudinal axis of a workpiece to provide both the local heating and mechanical force in hot-forming a workpiece such as one taught by Haerr

(Fig. 2) wherein resistance heating elements (13) are located in both the upper die (elements 13, 18, 7) and lower die (elements 13, 10, 11, 12, 6).

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided the forming dies of the of Spiegel et al. with opposing electrodes and resistance heating elements in light of the teachings of Haerr in order to provide an effective means of hot forming local regions of the shaft.

12. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al.

Spiegel et al. teaches the invention cited including the step of heating the shaft that carries the cams but do not explicitly teach that the longitudinal portions of the shaft carrying the cams are maintained at a temperature which prohibits changes in the structure or stress in the shaft at said portions.

However, it would have been obvious to one of ordinary skill in the art at the time of invention to have protected the cam carrying portions of Spiegel et al. shaft from any unnecessary temperature gradients that would have had an adverse effect on the structural integrity of the shaft in order to provide a strong and effective cam/shaft connection.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARANG AFZALI whose telephone number is (571)272-8412. The examiner can normally be reached on 7:00-3:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sarang Afzali/
Examiner, Art Unit 3726
5/21/2008

/David P. Bryant/
Supervisory Patent Examiner, Art Unit 3726